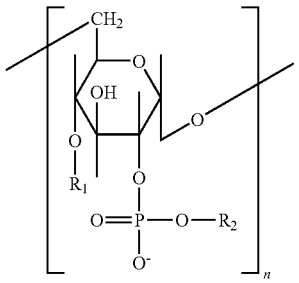
-continued



3

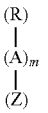
R_1 = $—CH_2—CH_2—{}^+NH(CH_2CH_3)_2$

R_2 = straight chain or branched alkyl, alkenyl, cycloalkyl, aryl, alkoxy, thioalkyl or thioether group having from 12 to about 24 carbon atoms

n = 50-600 (chain length)

We claim:

1. A compound having the structure



and salts thereof where:

m of $(A)_m$ is 1;

R is R_B, where R_B is a steroid selected from the group consisting of stigmasterol, ergosterol, and cholic acid;

A is A_3 where:

A_3 is —NH—CH_2— or —CO—N—R_1—, where A_3 is —NH—CH_2— when R is cholic acid and A_3 is —CO—N—R_1— when R is stigmasterol or ergosterol; where R_1 is an alkyl, alkenyl, alkynl, alkoxy, acyl or alkylthio having from 1 to about 24 carbon atoms; and

where Z is selected from the group consisting of Z_1-Z_{15} or Z_{18}; where:

Z_1 is H;

Z_2 is $—(CH_2)_n—X$, where n is 1-24 and X is selected from the group consisting of Br, Cl, I and F;

Z_3 is $—(CH_2)_n—NH_2$, n=1-24;

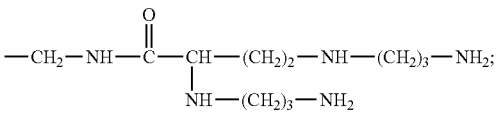
Z_4 is $—CH_2—NH—(CH_2)_3—NH—(CH_2)_4—NH_2$;

Z_5 is $—CH_2—NH—(CH_2)_3—NH—(CH_2)_3—NH—(CH_2)_3—NH_2$;

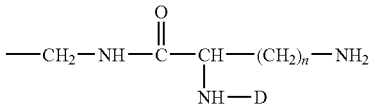
Z_6 is $—CH_2—NH—(CH_2)_n—NH_2$, n=2-24;

Z_7 is -L-X where L is selected from the group consisting of branched or straight chain alkyl, alkenyl, cycloalkyl, aryl, alkoxy, thioalkyl and thioether groups having from 1 to about 24 carbon atoms, and X is selected from the group consisting of Br, Cl, I, F, NH_2 and $[(NH_2)—(CH_2)_n]_m$ where n is 2-24 and m is 1-24;

Z_8 is



Z_9 is



where n=1-24, D is H or other groups attached by amide or alkyl amino groups;

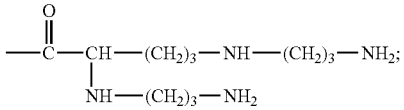
Z_{10} is a reporter molecule;

Z_{11} is a protein, peptide or polypeptide;

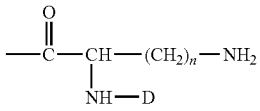
Z_{12} is a polysaccharide;

Z_{13} is an amine or halide reactive group;

Z_{14} is



Z_{15} is



n=1-24, D is H or other groups attached by amide or alkyl amino groups; and

Z_{18} is a nucleic acid binding substance.

2. The compound of claim **1** wherein A_3 is —CO—N—R_1— and R_B is stigmasterol.

3. The compound of claim **1** where A_3 is —CO—N—R_1— and R_B is ergosterol.

4. A composition for transfecting a cell with a nucleic acid which comprises a nucleic acid and one or more compounds according to claim **1**.

5. A lipid aggregate which comprises one or more compounds of claim **1**.

6. A kit for preparing a lipid aggregate comprising one or more compounds according to claim **1**.

7. A method for transfecting a cell comprising the step of contacting the cell with a lipid aggregate comprising a nucleic acid and a compound according to claim **1**.

8. A composition for transfecting a cell with a nucleic acid which comprises a compound according to claim **1** capable of complexing said nucleic acid to be transfected into said cell, and a transfection-enhancing agent selected from the group consisting of an enveloped virus, a membrane virus, a viral component, and a non-viral fusagenic compound.

9. A composition according to claim **8** wherein said transfection-enhancing agent is an enveloped virus, and wherein said enveloped virus is an alphavirus.

10. A composition according to claim **9** wherein said alphavirus is Semliki Forest virus.

11. A composition according to claim **8** wherein said transfection-enhancing agent is a viral component and wherein said viral component is selected from the group consisting of